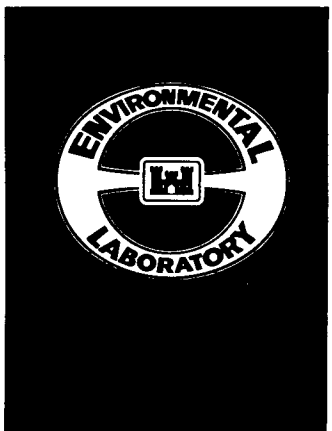
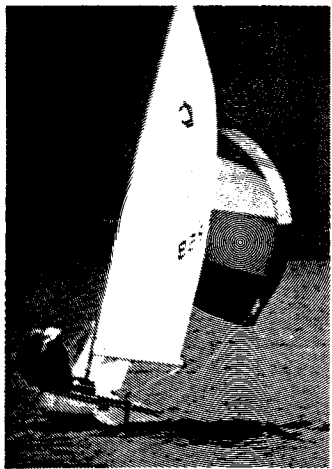




**US Army Corps
of Engineers**
Waterways Experiment
Station



RECNOOTES

NATURAL
RESOURCES
RESEARCH
PROGRAM

VOL R-87-3

INFORMATION EXCHANGE BULLETIN

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Natural Resources Research Program Publications

*Coughlin, R. E., Berry, D., and Cohen, P. 1978. "Modeling Recreation Use in Water-Related Parks," Technical Report R-78-1, prepared by the Regional Science Research Institute for the Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A071 898. 55 pp. Distribution: OCE; Division and District Libraries.

Earlier work of the US Army Corps of Engineers on the recreation use of reservoir parks is extended to nonreservoir parks. A thorough review of the literature was followed by a test of several models including those already tested by the US Army Engineer District, Sacramento. For the test, data from New York State Parks were used. The results were somewhat weaker than those obtained by the Sacramento District, which was attributed, in part, to the fact that the data were collected for another purpose and did not contain as many observations as would be desirable for a spatial analysis of this type.

*Mischon, R. M., and Wyatt, R. C. 1978. "Development of Improved Decision-Oriented Recreation User Information System," Technical Report R-78-2, prepared by the Midwest Research Institute for the Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A062 795. 113 pp. Distribution: OCE; Division and District Libraries.

As a result of the growing number of visitors at Corps projects, planners and managers need information concerning the recreation activities, facilities, and preferences of these users. To provide these needs, research was performed to improve visitation input data for the Recreation Resource Management System (RRMS) and to evaluate the needs for an overall recreation

information system. There were five major tasks identified as needed to implement the authors' recommendations regarding improving visitation data and development of an overall recreation information system: (1) research and analysis; (2) collection and storage of data; (3) generation of computer software requirements; (4) training and quality control; and (5) reporting.

*Mischon, R. M., and Wyatt, R. C. 1979. "A Handbook for Conducting Recreation Surveys and Calculating Attendance at Corps of Engineers Projects," Technical Report R-79-1, prepared by the Midwest Research Institute for the Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A068 677. 76 pp. Distribution: OCE; Division and District RRP designated representatives; Division and District Operations and Planning Branches; Project Offices.

Survey and analytical techniques are described that will produce standardized estimates of recreation visitation. Earlier research concluded that each Corps District and project essentially had developed its own procedures for collecting visitation data for the Recreation Resource Management System (RRMS). The procedures in the handbook utilized the best of these techniques with several minor changes to improve the quality of the visitation data.

*Urban Research and Development Corporation. 1980. "Recreation Carrying Capacity Design and Management Study," Technical Report R-80-1, prepared for the Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A090 704. 355 pp. Distribution: OCE; Division and District RRP designated

* Available only through NTIS.

representatives; Recreation Research and Demonstration Units; Project Offices.

The increase in use of Corps recreation facilities and prospects of even greater demand have brought about two major consequences and concerns: resource overuse and user overcrowding. More definitive recreation carrying capacity design and management guidelines are needed to preserve recreation qualities while offering a range of recreation opportunities.

Findings and recommendations of the Recreation Carrying Capacity Design and Management Study are presented. Results of site analyses, management interviews, and user surveys are included for the 11 Corps projects that were studied. Methodologies for determining recreational carrying capacity levels were developed, as well as carrying capacity design and management techniques for use in preventing and correcting problems of overcrowding, overuse, and underuse of recreation resources. Demonstrations are given to show how carrying capacity guidelines can be developed and applied.

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*Bumgardner, Walter H. 1980. "Development of a Methodology for Preparing Performance Standards for Operation and Maintenance Activities at Corps of Engineers Recreation Areas," Miscellaneous Paper R-80-2, prepared by the University of Southern Mississippi for the Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A091 560. 64 pp. Distribution: OCE; Division and District RRP designated representatives; Recreation Research and Demonstration Unit Project Offices.

The quantity and quality of operation and maintenance (O&M) activities at US Army Corps of Engineers Civil Works Projects can be significantly increased through systematic application of work performance standards. Criteria for preparing O&M standards were identified and evaluated. Existing Corps procedures, those used by other agencies, and potentially useful new procedures were evaluated and incorporated into recommended procedures.

A methodology is described and illustrated for local preparation of O&M standards. Supporting rationale and optional techniques and sources of information are suggested for completing components of individual O&M standards. Example standards, developed from surveillance of maintenance activities at Corps projects, are illustrated.

A quality control plan is recommended for ensuring that O&M activities performed by contractors adhere to Corps-established criteria. Performance inspections, time frames of inspections, and identification of personnel to perform inspections are discussed. Options are examined for recouping costs of unsatisfactorily completed work. Recommendations are given for implementing a standards program and furthering the Corps research on this topic.

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*Urban Research and Development Corporation. 1980. "Recreation Carrying Capacity Handbook Methods and Techniques for Planning, Design, and Management," Instruction Report R-80-1,

prepared for the Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A096 446. 104 pp. Distribution: OCE; Division and District RRP designated representatives; Recreation Research and Demonstration Unit Project Offices.

The increase in use of Corps recreation facilities and the prospects of even greater demand have brought about two major consequences and concerns: resource overuse and user overcrowding. More definitive recreation carrying capacity design and management guidelines are needed to preserve recreation qualities while offering a range of recreation opportunities. This report presents a methodology for determining recreation carrying capacity levels based on the results of user surveys and site analyses. Carrying capacity planning, design, and management techniques are included for use in preventing and correcting problems of overcrowding, overuse, and underuse of recreation resources. Demonstrations are used to show how carrying capacity guidelines can be developed and applied.

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*Abbey, Robert V., and Propst, Dennis B. 1981. "A Methodology for the Systematic Collection, Storage, and Retrieval of Trend Data for the Army Engineers Recreation Program," Miscellaneous Paper R-81-1, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A098 274. 23 pp. Distribution: OCE; Division and District Libraries; Division and District Planning and Operation Branches; Project Offices.

Past, current, and proposed recreation information systems developed to assist Corps personnel in solving daily management and planning problems are reviewed. The Corps systems designed to collect and store trend data are still in their infancy and are being managed by the Recreation Research Program at the US Army Engineer Waterways Experiment Station (WES). The trend data described in this report were collected as part of a pilot study at three Corps campgrounds during the summer of 1979. The report also describes the systems of the Research and Demonstration Units (RDU) and of other agencies that collect, store, and utilize recreation user information.

The need to develop additional means of collecting trend data is based, in part, on the weaknesses of past Corps of Engineers recreation information systems. These problems, as well as the steps the Corps is taking to gather more reliable visitation and other trend data, are described in the report.

A major product of the proposed recreation user system will be the forecasting of national and regional trends in terms of recreation participation, sales of recreational equipment, and other factors that affect recreation use. Part of this system, the collection of more reliable visitation data, has already been implemented. The mechanics of the proposed recreation user system, potential uses, and relationship to existing systems are herein described.

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Hart, William J. 1981. "Recreation Research and Demonstration System: Its Selection, Operation, and Potential Utility," Technical Report R-81-1,

US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A099 751. 112 pp. Distribution: OCE; Division and District RRP designated representatives.

A Recreation Research and Demonstration System (RRDS) consisting of 24 Recreation Research and Demonstration Units (RRDUs) and 9 Recreation Use Monitoring Stations (RUMSs) has been activated. The purpose of the demonstration system is to provide permanently designated outdoor laboratories for the conduct of research in the physiographic, social, economic, and institutional aspects of recreation and related natural resources.

The RRDS represents a stratified 6-percent sample of Corps water resource development projects for which the Corps exercises operational control over the recreation and related natural resources (RRDUs) plus representative examples of important recreation projects for which the Corps is not now credited with responsibility (RUMs). The sample accurately mirrors the size, geographic distribution, attendance, and administrative mode found in the Corps-wide system of recreation projects.

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*Propst, Dennis, and Roggenbuck, Joseph. 1981. "A Guide to Cultural and Environmental Interpretation in the U.S. Army Corps of Engineers," Instruction Report R-81-1, Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss. (NTIS No. AD 104 250). 147 pp. Distribution: OCE; Division and District Libraries; Division and District Planning and Operation Branches; Project Offices.

The goal of the Corps' Visitor Perception and Interpretives Services Program is to "inform and educate the public with regard to the purposes and concept of operation of the water project and the historical and natural features of the area." This manual is designed to assist Corps personnel in developing and implementing interpretive services at water resource projects. Subject areas include designing interpretive objectives, selecting appropriate messages to convey, understanding the visitor, choosing the appropriate media, selecting interpretive personnel, and evaluating interpretive services. References are listed for each of the topics.

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*Propst, Dennis. 1981. "Impact of the Energy Crisis on Corps of Engineers Recreation Program," Miscellaneous Paper R-81-2, Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD 104 779. 45 pp. Distribution: OCE; Division and District Libraries; Division and District Planning and Operations Branches.

Increases in fuel costs and sporadic shortages in fuel supplies have had an impact on recreation use of Corps Projects. Literature was reviewed with regard to the impact of energy prices and supplies on visitation and recreation use patterns at non-Corps recreation areas. In addition, visitation figures for Corps projects were examined for the years of 1977 through 1979 to determine whether there was any correlation between 1979 fuel shortages and price increases and Corps

visitation trends. Due to the quality and detail of Corps recreation data, only the broadest statements on future trends could be made. Energy-related trend forecasts were that recreation use would generally continue to increase steadily at Corps recreation areas due to their proximity to population centers and that visitors would tend to stay longer at one destination.

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*Epps, James W., Corey, Marion W., and Cullinane, M. John. 1982. "Innovative Roadway Design for Recreation Areas," Miscellaneous Paper R-82-1, Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A133 248. 40 pp. Distribution: OCE; Division and District Libraries; Operation, Planning, and Design Branches.

Access and circulation roads are estimated to contribute approximately 60 percent of the costs associated with recreation area development. The planning and design of recreational area roads may be viewed as a three-phase process involving: (1) routing of the traffic flow based on destination analysis; (2) geometric design of the roadway system; and (3) design of appropriate pavement structures. The accomplishment of each of these phases has depended heavily on traditional highway design practice with a resultant cost penalty. Standard design criteria and construction techniques are being increasingly viewed by present-day planners as overly conservative and not widely applicable to implementation of cost-effective low volume road systems.

In recognition of the need for the application of the latest roadway planning and design techniques, a review of available literature on the topic was accomplished. The objective of this effort was to develop information that will assist Corps of Engineers Districts in optimizing the design and operation of recreation area roadway systems.

Efforts have been directed at four categories of roadway planning and design activities where costs savings may be anticipated. These activities include: (1) development of new planning and design techniques; (2) revision of geometric design criteria; (3) investigation of new pavement materials and design techniques; and (4) development of rapid and effective maintenance methods.

Interim results of the study indicate that techniques are available that have the potential for considerably reducing the cost of recreation area roadway construction. Automated planning techniques are particularly relevant.

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*Curtis, Gregory, Jackson, Scott, Hansen, William, and Rorabacher, John. 1982. "Development and Evaluation of the Campground Receipt Study," Miscellaneous Paper R-82-2, Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A114 128. 59 pp. Distribution: OCE; Division and District Libraries; Operation and Planning Branches; Project Offices.

Little recreation information that describes visitor use

patterns and characteristics has been collected systematically at Corps projects.

A System has been developed to collect information concerning visitor characteristics at Corps of Engineers fee campgrounds. This system has proved to be an effective method of collecting reliable trend data and is costefficient. The Campground Receipt Study (CRS) is the development and field testing of this system. This report describes the development and evaluation of the 1980 test of the CRS.

Examples of some possible analyses of data from the CRS data are presented to illustrate the potential usefulness of the information to all levels of management and planning as well as to recreation researchers within the Corps. The analyses are based on data collected during only a portion of the 1980 recreation season and are, therefore, only presented for illustrative purposes. They indicate the type of information that could be readily provided to decisionmakers and researchers through implementation of the CRS procedures. The analyses presented are not intended to be a complete list of uses for the data; other applications can be found within the Corps as well as from other Federal agencies, universities, and private research organizations.

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Jackson, Scott. 1982. "Summary Report: Visitor Safety and Security at Corps of Engineer Projects," Technical Report R-82-1, Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A112 005. 31 pp. Distribution: OCE; Division and District Libraries; Operation and Planning Branches; Project Offices.

Limitations on manpower and authority have required the Corps of Engineers to investigate alternative measures for providing a safe and secure environment for Corps project visitors. This report provides a summary of recommended planning, design, and management techniques that will provide increased visitor safety and security at Corps projects. This publication represents a summary of a contract report, "Visitor Safety and Security at Corps of Engineers Projects," which was prepared by Gage-Babcock and Associates, Inc.

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Curtis, Gregory, and Hansen, William. 1982. "Summary of the 1981 Campground Receipt Study," Miscellaneous Paper R-82-3, Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A122 095. 56 pp. Distribution: OCE; Division and District Libraries; Operation and Planning Branches; Project Offices.

This report describes the collection and summarization of the 1981 (calendar year) Campground Receipt Study (CRS) data. These data represent the first complete year of data collection and as such are the best available sample of descriptive characteristics of visitors at Corps fee campgrounds nationwide.

Data collection includes visitor characteristics (e.g., length of stay and group size), vehicle type, and camping and other recreation equipment used. These data are summarized for the 15 participating projects as well as for the total sample (119,929 fee permits). Potential uses of the data are also

illustrated including analyses of visitor origins, campsite and facility (i.e., electrical hookup) usage, and trends.

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Bumgardner, Walter. 1983. "Alternative Approaches to Operating and Maintaining Recreation Areas," Technical Report R-83-1, Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A125 745. 44 pp. Distribution: OCE; Division and District Libraries; Operation and Planning Branches; Project Offices.

This document summarizes the findings and conclusions of the US Army Engineer Waterways Experiment Station (WES) research project, "Cost Efficiency of Methods of Operating and Maintaining Corps Recreation Areas." It consolidates the findings of three separate but closely related substudies comprising the project. The substudies were: (a) an identification of existing approaches used within the Corps for conducting operations and maintenance (O&M) activities; (b) documentation and comparison of costs incurred with O&M activities; and (c) development of a methodology for the preparation of O&M performance standards. The internal working document from which this information was extracted is on file at WES.

The existing approaches substudy revealed that O&M activities were being conducted through the use of: (a) in-house Corps resources; (b) contractual arrangements; and (c) a combination of in-house resources and contractual arrangements. Most of the O&M work was being conducted through contractual arrangements. The highest level of satisfaction was with O&M activities conducted in-house, followed by the combined approach. Managers were more dissatisfied with the contract approach than either the in-house or combined approach.

Although the findings were somewhat inconclusive about O&M costs, they suggest that contracting is more often cost efficient than conducting O&M activities with in-house resources, particularly under conditions of high overall project visitation and high levels of overnight use. It was undetermined whether the contract or in-house approach was more cost efficient under conditions of low overall visitation. The availability of local labor had no effect on O&M costs.

In suggesting a methodology for local preparation of O&M performance standards, it was concluded that qualitative indicators as well as the amounts of manpower, time, equipment, and supplies and the associated costs should be delineated for specific work tasks.

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Waring, Michael, Hodgson, Ronald, Walski, Thomas, and Lindsey, Anita. 1983. "Computing Cost-Effectiveness of Alternative Sanitary Facilities," Instruction Report R-83-1, Environmental Laboratory, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss. 51 pp. Distribution: OCE; Division and District Libraries; Operation and Planning Branches; Project Offices.

Sanitary facilities at Corps of Engineers recreation areas contribute significantly to the total cost for both construction and operations and maintenance. In many cases, these costs

appear to be unrealistic and the resultant facilities not cost-effective. This is especially true when the facilities are either oversized or undersized for the level of development or visitation of the area.

This lack of cost-effectiveness can be partially attributed to the lack of any formal methodology that incorporates visitor preferences, by which the planner or designer can quickly evaluate a number of alternative design parameters very early in the development or rehabilitation of a recreation area. The methodology presented in this report addresses this problem through not only the actual costs, but also the visitor preferences and management considerations.

A sample problem is included to illustrate one way in which the methodology may be used.

Walter Bumgardner. 1983. "Perceptions of the Corps of Engineers' Recreation Concession Program," Miscellaneous Paper R-83-1, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss. Distribution: OCE; Division and District Libraries; Operation and Planning Branches; Project Offices.

This report summarizes user perceptions and concerns expressed by concession managers and Corps personnel for improving the Corps of Engineers' recreation concession program. The findings of a user survey confirm that most users are highly satisfied with the quality and availability of services and facilities provided at Corps concessions. Recommendations on additional facilities that should be provided to meet user needs are identified. A distinction is made between facilities and services traditionally provided by concessions and those provided by the Corps. Basically, users would be pleased with more of the same types of services and facilities being provided.

Potential obstacles inherent in the Corps' concession program that present some limitations to the overall responsiveness to users are discussed. Recommendations are provided for improving the effectiveness of the Corps' concession program.

Curtis, G. L. 1983. "Summary of the 1982 Campground Receipt Study," Miscellaneous Paper R-83-2, US Army Engineer Waterways Experiment Station, CE, Vicksburg, Miss., NTIS No. AD A140 532.

The Campground Receipt Study (CRS) has been developed for the systematic collection of information concerning visitor characteristics at Corps of Engineers fee campgrounds. This system has proved to be an effective method of collecting reliable trend data and is cost efficient. The system began in 1980.

This report describes the collection and summarization of the 1982 (calendar year) CRS data. It also compares the 1982 data with previously collected CRS data to examine trends in visitor characteristics. The data collected include visitor characteristics (e.g., length of stay and group size), vehicle type, and camping and other recreation equipment (e.g., power boats and bicycles) used by fee campers. The CRS data are collected at 15 Corps lakes throughout the country. During 1982, a total of 149,576 CRS fee receipts were collected at the 67 fee campgrounds located at these lakes.

The CRS data presented here represent the best available nationwide sample of descriptive characteristics of visitors to Corps fee campgrounds. The resulting data base could be used effectively at all levels within the Corps to examine current use patterns and to monitor and evaluate changes in visitor characteristics if collected over a representative time period.

Several practical applications of the data base demonstrate the types of information that can be extracted: evaluation of the use of electric hookups; determination of market areas of projects and/or recreation areas by using a FORTRAN program developed to identify county of origin of visitors to an area; estimation of volume of fee receipts issued; determination of use of campsites, recreation areas, and projects; and comparison of increases in user fees with area visitation and occupancy rates.

*Environmental Laboratory. 1984. "Supplements to a Guide to Cultural and Environmental Interpretation in the U.S. Army Corps of Engineers," Instruction Report R-84-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss., NTIS No. AD A147 037.

Nine reports were prepared to supplement the Recreation Research Program publication entitled "A Guide to Cultural and Environmental Interpretation in the U.S. Army Corps of Engineers" (NTIS No. AD 104 250). "A Guide to Cultural and Environmental Interpretation in the U.S. Army Corps of Engineers" provides general guidelines for planning, implementing, and evaluating interpretation services and selecting interpretation personnel at Corps water resources development projects. These supplements provide guidance on the following interpretation techniques:

- Goal Analysis and Performance Objectives
- Interpretation Planning
- Evaluating Interpretation
- Audience Analysis Techniques
- Interpretation for Management
- Selected Interpretive Writing Guidelines
- Design Guidelines for Bulletin Boards, Amphitheaters, and Self-Guided Trails
- Audiovisual Presentations (simple and complex)
- Colleges and Universities Offering Coursework in Interpretation

Waring, M. R., et al. 1985. "Key Indicators of Recreation Use for 1983, Preliminary Findings," Miscellaneous Paper R-85-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss., NTIS No. AD A153 874.

Recreation areas and campsites at Corps of Engineers water resource projects have a large variety of natural and man-made attributes from which the camper can select. This study sought to identify, from this larger group of attributes, those which are most often preferred by the user.

Preference research usually falls into one of two categories: (a) stated preferences solicited through direct questionings, or (b) revealed preferences documented through examination of actual behavior. Both methods were used in this study to serve not only as a validity check, but also to ensure that a full coverage of preference attributes was incorporated into the study.

Preference data for campsite and recreation area attributes were obtained from campers at five Corps of Engineers lakes. Findings across the five lakes indicated that, in general, campers select campsites based on the presence of utilities, lake view, shade, vegetation buffering, distance to lake, back-in and impact pads, and proximity and type of sanitary facilities. Additionally, preferences in recreation areas were based on size of the area, type and quantity of the sanitary facilities, number of showers, and presence of utilities at the campsites.

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Fritschen, J. A. 1985. "Summary of the 1983 Campground Receipt Study," Miscellaneous Paper R-85-2, US Army Engineer Waterways Experiment Station, Vicksburg, Miss., NTIS No. AD A156 395.

The Campground Receipt Study (CRS) was established to systematically collect information on visitor characteristics at Corps of Engineers fee campgrounds. This system has proved to be an effective and efficient method of collecting trend data. The system was pretested in 1979, then expanded to include all CRS projects in 1980.

Since the creation of the CRS there have been a great many changes in the study procedures, data collection form, and study sites. These changes are described in this report. The main purpose of the report, however, is to describe the 1983 CRS data and the trends in camping use indicated by the CRS data collected from 1981 to 1983.

The CRS data represent the best available nationwide sample of descriptive characteristics of visitors to Corps campgrounds. The data base could be used effectively at all levels within the Corps to examine current use patterns and, with several years of data, to monitor and evaluate changes in visitor characteristics over time.

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Hodgson, R. W. 1986. "An Example of a Mailed Contingent Valuation Survey Method in a Marina Feasibility Study," Instruction Report R-86-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss., NTIS No. AD A169 498.

Feasibility analysis often requires estimates of potential monetary returns and economic benefits proposed projects will generate. In 1981 a study was conducted to provide demand data that could be used to make such estimates for a marina feasibility study at a Corps of Engineers lake in the Midwest. The study employed self-administered contingent valuation methods (CVM) to estimate consumer willingness to pay to rent mooring facilities. Because such methods have potential for application to many similar problems on Corps projects, this report was prepared explaining the self-administered CVM approach using the previous study as an example.

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Environmental Laboratory. 1986. "Field Guide for Low-Maintenance Vegetation Establishment and Management," Instruction Report R-86-2, US Army Engineer Waterways Experiment Station, Vicksburg, Miss., NTIS No. AD A116 309.

This field guide was written primarily for natural resource and project managers of Corps of Engineer (CE) reservoir projects who are faced with the increased costs of establishing and maintaining vegetation. The guide is also applicable to other types of project areas. It was designed to serve as an immediately available reference for the resource manager who may not have had an extensive background in soil and plant science.

A flow diagram that guides the manager through problem assessment and problemsolving information is included in each of the five parts. Part II guides the manager through steps and checklists for cataloging, defining, locating, and quantifying vegetation problems. Part III presents basic considerations that will allow the manager to identify resource data needs and make observations which generally identify vegetative establishment and maintenance problems.

Part IV assists the manager in assessing whether necessary resource data bases are available and which procedures are necessary to obtain this information. Part V provides low-maintenance strategies and information to aid the manager in identifying major climatic zones of the project area and in selecting and using vegetation types (i.e., grasses, shrubs, trees). Part V also addresses special problems, erosion control, and off-road vehicle strategies.

This guide is intended for use by CE natural resource personnel in selecting and maintaining appropriate vegetation types for certain soil, terrain, and site uses. It addresses use of desirable, low-growth, low-maintenance vegetation species applicable to CE project areas. Application of these procedures could lower overall project costs by eliminating expenditures on inappropriate vegetation and physical structures.

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Lawrence, L. R., and Fritschen, J. A. 1986. "Summary of the 1984 Campground Receipt Study," Miscellaneous Paper R-86-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss., NTIS No. AD A174 447.

The Campground Receipt Study (CRS) was established to systematically collect information on visitor characteristics at Corps of Engineers fee campgrounds. This system has proved to be an effective and efficient method of collecting trend data. The system was pretested in 1979, then expanded to include 16 CRS projects in 1984.

Since the creation of the CRS there have been a great many changes in the study procedures, data collection form, and study sites. These changes have been described in previous reports. The main purpose of the report is to describe the 1984 data and the trends in camping use indicated by the CRS data collected from 1981 to 1984.

The CRS data represent the best available nationwide sample of descriptive characteristics of visitors to Corps campgrounds. The data base can be used by all levels within the Corps to examine current use patterns and, with several years of data, to monitor and evaluate changes in visitor characteristics over time.

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*Fritschen, J. A., and Lawrence, L. R. 1987. "Catalog of Computer Programs for Project Management," Miscellaneous Paper R-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss., NTIS No. AD A181 138.

This publication contains a description of computer programs currently available for project management. These include programs developed for use on a microcomputer, as well as those which run on a host computer but are accessed by a terminal in a field office. A one-page description of each program contains the title; preparing agency abstract; a summary of the data inputs and outputs; equipment, disk, and memory requirements; operating system and programming language; and a contact for further information. The programs described in this publication are not limited to those available within the Corps, but also include those available from other government and nongovernment sources.

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Waring, Michael R. 1987. "Guidelines for Determining Key Indicators of Recreation Use," Instruction Report R-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss., NTIS No.

Preference data for campsites were obtained from campers at five Corps of Engineers lakes. Findings across the five lakes indicated that, in general, campers select sites based on (a) the

presence of utilities, (b) the quality, closeness, and number of obstacles to the sanitary facilities, (c) the distance to a view of the lake, and (d) the amount of shade or canopy closure.

These "key indicators" can be used by both managers and planners to predict visitation patterns, to influence the use of specific sites by a particular group or type of user, to modify the amount of visitation between underused and overused sites, and to determine how and where limited manpower and funds can best be spent in building or modifying sites. These indicators can also be used to justify differential fee structures for different sites.

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Lawrence, L. R. 1987. "Summary of the 1985 Campground Receipt Study," Technical Report R-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss., NTIS No.

This report summarizes data collected in 1985 from each of the 16 Campground Receipt Study projects. Comparisons are made regarding the number and types of permits issued as well as the following user characteristics: length of stay, group size, prior visits, primary destination, vehicle type, and camping equipment. Current trends in the use of campground facilities are considered, as determined through the comparison of data from 1981 through 1985. Finally, conclusions and recommendations are made about applications of the data analyses to management needs.

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NATURAL RESOURCES RESEARCH PROGRAM

This bulletin is published in accordance with AR 310-2. It has been prepared and distributed as one of the information dissemination functions of the Environmental Laboratory of the Waterways Experiment Station. It is primarily intended to be a forum whereby information pertaining to and resulting from the Corps of Engineers' nationwide Natural Resources Research Program can be rapidly and widely disseminated to OCE and Division, District, and project offices as well as to other Federal agencies concerned with outdoor recreation. Local reproduction is authorized to satisfy additional requirements. Contributions of notes, news, reviews, or any other types of information are solicited from all sources and will be considered for publication as long as they are relevant to the theme of the Natural Resources Research Program, i.e., to improve the effectiveness and efficiency of the Corps in managing the natural resources while providing recreation opportunities at its water resources development projects. This bulletin will be issued on an irregular basis as dictated by the quantity and importance of information to be disseminated. Communications are welcomed and should be addressed to the Environmental Laboratory, ATTN: A. J. Anderson, U.S. Army Engineer Waterways Experiment Station, P.O. Box 631, Vicksburg, MS 39180-0631, or call AC 601, 634-3657 (FTS 542-3657).

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Colonel, Corps of Engineers
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